

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

In re application of	)	
Thomas S. Dewitz et al	)	Confirmation No. 1987
Serial No. 10/521,509	)	Group Art Unit: 1797
Filed July 13, 2005	)	Examiner: Sonji Lucas Turner
SWIRL TUBE SEPARATOR	)	July 7, 2009

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COMMISSIONER FOR PATENTS  
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF

On April 20, 2009, the Applicants filed a Notice of Appeal from the final rejection of Claims 1-7 mailed January 21, 2009. The Panel has not yet mailed their Decision from Pre-Appeal Brief Review. Applicants are appealing the rejection of Claims 1, 9, and 12 from the final rejection mailed January 21, 2009. Please charge any necessary fee for this brief, any necessary extension fees, and any other required fees to Shell Oil Company Deposit Account No. 19-1800.

Real Party in Interest

The Real Party in Interest in this appeal is the Assignee, Shell Oil Company. The inventors assigned the application to Shell Oil Company.

Related Appeals and Interferences

There are no known related appeals or interferences.

### Status of Claims

Claims 1 through 15 were originally presented for examination, and Claim 6 has been canceled and withdrawn from consideration.

Claims 1, 9, and 12 are rejected under 35 U.S.C. 102(b) as obvious over Fernandes (US 3,590,558).

Applicant filed a Notice of Appeal and Pre-Appeal Brief Request for Review on April 20, 2009.

The Panel Decision from Pre-Appeal Brief Review has not yet been mailed.

The claims which are under consideration in this appeal are Claims 1, 9, and 12, as shown in the Appendix hereto. Claims 2-5, 7-8, 10-11, and 13-15 are not being appealed.

### Status of Amendments

There have been no amendments to the claims.

### Summary of Claimed Subject Matter

The claimed invention as set forth in Claims 1, 9, and 12 is illustrated in Figures 1-4, and described in the application text at Page 10, Line 19 to Page 11, Line 28.

#### The claimed invention as set forth in Claim 1 is:

A swirl tube separator for separating solids from a gas-solid containing feed comprising:  
a tubular housing (1, Page 10, Line 20);  
an axial inlet (9, Page 10, Lines 20-21) for introducing a gas-solids mixture at a first end of said housing (1, Page 10, Line 20), wherein said axial inlet (9, Page 10, Lines 20-21) for introducing the gas-solids mixture is provided with swirl imparting means (10, Page 10, Lines 20-23);  
a solids outlet opening (3, Page 10, Lines 23-25) at a second end of said housing (1, Page 10, Line 20); and  
a co-axial positioned tubular gas outlet conduit (4, Page 10, Lines 22-26) placed at the first end of said housing (1, Page 10, Line 20) such that the axial inlet (9, Page 10, Lines 20-21) for introducing a gas-solids mixture is positioned in the space between the tubular gas outlet conduit (4, Page 10, Lines 22-26) and the wall of the tubular housing (1, Page 10, Line 20) , wherein along the axis (5, Page 10, Lines 26-28) of the tubular housing (1, Page 10, Line 20) a vortex extender pin (11, Page 10, Lines 26-28) is present; further wherein the solids outlet

opening (3, Page 10, Lines 23-25) comprises an annular opening (space between pin 11 and housing 1) about the vortex extender pin (11, Page 10, Lines 26-28) .

The claimed invention as set forth in Claim 9 is:

The swirl tube separator according to claim 1, wherein the pin (11, Page 10, Lines 26-28) extends from the interior of the gas outlet conduit (4, Page 10, Lines 22-26) into the tubular housing (1, Page 10, Line 20) and wherein the pin (11, Page 10, Lines 26-28) is fixed within the gas outlet conduit (4, Page 10, Lines 22-26) by means of supporting means (13, Page 10, Lines 32-36), said supporting means (13, Page 10, Lines 32-36) are swirl means (13, Page 10, Lines 32-36) which swirl means (13, Page 10, Lines 32-36) are positioned such that they decrease the swirling motion of the gas being discharged via the gas outlet conduit (4, Page 10, Lines 22-26)

The claimed invention as set forth in Claim 12 is:

The swirl tube separator according to claim 1, wherein the inlet (9, Page 10, Lines 20-21) for introducing the gas solids mixture and the gas outlet conduit (4, Page 10, Lines 22-26) are arranged at one end of the tubular housing (1, Page 10, Line 20) and the solids outlet opening (3, Page 10, Lines 23-25) is positioned at the opposite end of said housing (1, Page 10, Line 20).

Grounds of Rejection to be Reviewed on Appeal

As stated in the Final Rejection of August 1, 2008, Claims 1, 9, and 12 were rejected under 35 USC §102(b), as being unpatentable over Fernandes, Applicant hereby appeals these rejections.

The rejections of Claims 2-5, 7-8, 10-11, and 13-15 are not being appealed.

Argument - The Rejection of Claim 1

Claim 1, 9, and 12 were rejected under 35 USC §102(b), as being unpatentable over Fernandes. Applicants hereby appeal this rejection.

In paragraph 3 of the Office Action, the Examiner rejected claims 1, 9, and 12 as being unpatentable over Fernandes (U.S. Patent 3,590,558)("Fernandes"). Applicants respectfully traverse the rejection.

As explained above Independent claim 1 recites " ... wherein along the axis of the tubular housing a vortex extender pin is present; further wherein the solids outlet opening comprises an annular opening about the vortex extender pin." (emphasis added).

As the Examiner stated in the Office Action, Fernandes teaches a swirl separator (10) with a tubular housing (24) and axial inlet (46) with a swirl imparting means (44), a solid outlet opening (68), a co-axial gas outlet conduit (32) and bulb (74).

Fernandes does not teach or suggest the desirability of the solids outlet opening comprising an annular opening about a vortex extender pin as taught in applicants' Claim 1.

The *American Heritage Dictionary*, 4<sup>th</sup> Edition, defines annular as "shaped like or forming a ring." The *American Heritage Dictionary*, 4<sup>th</sup> Edition, defines about as "all around, on every side, on all sides, surrounding."

In other words, the annular opening in claim 1 is a ring shaped opening surrounding the vortex extender pin, or a ring shaped opening with the vortex extender pin in the middle.

The opening in Fernandes (68) is a very small hole provided in the bottom (54) of the tubular housing (24). This opening (68) will lead to the solids remaining at the bottom (54) and being reentrained in the vortex. In contrast an annular opening as taught in applicants' Claim 1 will allow improved solid separation from a gas.

Fernandes does not teach or suggest the desirability of an annular opening as recited in claim 1.

Dependent Claims 9 and 12 are allowable for at least the same reasons as independent Claim 1, discussed above, from which they depend.

Applicants respectfully request that the Examiner withdraw the rejection to Claims 1, 9, and 12.

## CONCLUSION

The Applicant assert that the arguments presented above overcome the rejection of Claims 1, 9, and 12.

Respectfully submitted,  
Dewitz et al.

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## CLAIMS APPENDIX

### Listing of Claims

1. (Previously Presented) A swirl tube separator for separating solids from a gas-solid containing feed comprising:  
a tubular housing;  
an axial inlet for introducing a gas-solids mixture at a first end of said housing, wherein said axial inlet for introducing the gas-solids mixture is provided with swirl imparting means;  
a solids outlet opening at a second end of said housing; and  
a co-axial positioned tubular gas outlet conduit placed at the first end of said housing such that the axial inlet for introducing a gas-solids mixture is positioned in the space between the tubular gas outlet conduit and the wall of the tubular housing,  
wherein along the axis of the tubular housing a vortex extender pin is present; further wherein the solids outlet opening comprises an annular opening about the vortex extender pin.
2. (Previously Presented) The swirl tube separator according to claim 1, wherein the pin is present along at least 20% of the axis of the tubular housing, said axis running from the first end to the second end.
3. (Previously Presented) The swirl tube separator according to claim 2, wherein the pin is from 30% to 100% of the axis of the tubular housing.
4. (Original) The swirl tube separator according to claim 3, wherein the pin is present along 100% of the axis of the tubular housing.
5. (Original) The swirl tube separator according to claim 4, wherein the pin extends from the interior of the gas outlet conduit into the tubular housing and wherein the pin is fixed within the gas outlet conduit by means of supporting means, said supporting means are swirl means which swirl means are positioned such that they decrease the swirling motion of the gas being discharged via the gas outlet conduit.
6. (Canceled).
7. (Original) Multi separator provided with a plurality parallel operating swirl tube separators

according to claim 1.

8. (Original) A process to separate solids from a solids laden gaseous mixture having a solids content of between 100 and 500 mg/Nm<sup>3</sup> to obtain a gaseous stream containing less than 50 mg solids per Nm<sup>3</sup> in a swirl tube according to claim 1.

9. (Original) The swirl tube separator according to claim 1, wherein the pin extends from the interior of the gas outlet conduit into the tubular housing and wherein the pin is fixed within the gas outlet conduit by means of supporting means, said supporting means are swirl means which swirl means are positioned such that they decrease the swirling motion of the gas being discharged via the gas outlet conduit.

10. (Original) The swirl tube separator according to claim 2, wherein the pin extends from the interior of the gas outlet conduit into the tubular housing and wherein the pin is fixed within the gas outlet conduit by means of supporting means, said supporting means are swirl means which swirl means are positioned such that they decrease the swirling motion of the gas being discharged via the gas outlet conduit.

11. (Original) The swirl tube separator according to claim 3, wherein the pin extends from the interior of the gas outlet conduit into the tubular housing and wherein the pin is fixed within the gas outlet conduit by means of supporting means, said supporting means are swirl means which swirl means are positioned such that they decrease the swirling motion of the gas being discharged via the gas outlet conduit.

12. (Original) The swirl tube separator according to claim 1, wherein the inlet for introducing the gas solids mixture and the gas outlet conduit are arranged at one end of the tubular housing (1, Page 10, Line 20) and the solids outlet opening is positioned at the opposite end of said housing.

13. (Original) The swirl tube separator according to claim 2, wherein the inlet for introducing the gas solids mixture and the gas outlet conduit are arranged at one end of the tubular housing (1, Page 10, Line 20) and the solids outlet opening is positioned at the opposite end of said housing.

14. (Original) The swirl tube separator according to claim 3, wherein the inlet for introducing

the gas solids mixture and the gas outlet conduit are arranged at one end of the tubular housing (1, Page 10, Line 20) and the solids outlet opening is positioned at the opposite end of said housing.

15. (Original) The swirl tube separator according to claim 4, wherein the inlet for introducing the gas solids mixture and the gas outlet conduit are arranged at one end of the tubular housing (1, Page 10, Line 20) and the solids outlet opening is positioned at the opposite end of said housing.

## EVIDENCE APPENDIX

There is no additional evidence relied upon by the Appellants in the Appeal.



## RELATED PROCEEDINGS APPENDIX

There are no related proceedings.